What is claimed

[c1] 1. A projection electron lithography system, comprising:

a lithography tool for emitting a beam of electrons and producing

measurement information; and

a processor including,

at least one model for producing predictive information, and

an estimator for controlling placement of the beam of electrons based

on the predictive information from said at least one model and measurement

information from said lithography tool.

[c2] 2. The system of claim 1, wherein said estimator compensates for

heating and beam drift effects.

[c3] 3. The system of claim 1, wherein said estimator is a Kalman filter,

using least-squares based linear matrix algebra.

[c4] 4. The system of claim 1, wherein said system is a SCALPEL

system.

[c5] 5. The system of claim 3, wherein said at least one model includes

a plurality of different models and said Kalman filter is an adaptive Kalman

filter, wherein said adaptive Kalman filter iteratively selects one of the

plurality of different models until a best one of plurality of different models

emerges.

[c6]   6.   The system of claim 3, wherein said at least one model includes

a plurality of different models and said Kalman filter is an adaptive Kalman

filter, said adaptive Kalman filter having a tunable strength parameter to

determine an optimal adaptation weighting criterion.

[c7]   7.   The system of claim 5, wherein the plurality of different models

includes three or more models.

[c8]   8.   The system of claim 6, wherein the plurality of different models

includes three or more models.

[c9]   9.   A process for controlling projection electron lithography,

comprising:

    emitting a beam of electrons;

    producing measurement information on said emitting step;

    producing predictive information related to the projection electron

lithography process, and

    controlling placement of the beam of electrons based on the predictive

information and the measurement information.

[c10] 10.   The process of claim 9, wherein said controlling step is

implemented as a Kalman filter using least-squares based linear matrix

algebra.

[c11] 11.   The process of claim 9, wherein said controlling step

compensates for heating and beam drift effects.

[c12] 12.   The process of claim 9, wherein said process is a SCALPEL

process.

[c13] 13. The process of claim 9, wherein the predictive information is

produced by a plurality of different models, wherein said controlling step

iteratively selects one of the plurality of different models until a best one of

plurality of different models emerges.

[c14] 14.   The process of claim 9, wherein the predictive information is

produced by a plurality of different models, wherein said controlling step

has a tunable strength parameter to determine an optimal adaptation

weighting criterion.

[c15] 15.   The process of claim 14, wherein the plurality of different

models includes three or more models.

[c16] 16.   The process of claim 14, wherein the plurality of different

models includes three or more models.